

Appendix 2

NOS Cartographic Codes and Symbols

*NOTE: Pages 2,4,14, and 18 were intentionally left blank in the original document.
These pages contained no information and are not reproduced here.*

SOURCE CARTOGRAPHIC CODES AND SYMBOLS
(Hydrographic)

The cartographic codes and symbols shown in the accompanying tables (A-1 through A6, B-1 through B-3 and C) shall be used to represent features on hydrographic survey smooth sheets and in digital hydrographic survey data files within the Hydrographic Surveys Branch. Control station codes are entered during hydrographic field work; the rest of the codes are entered as needed either during field work or office processing.

All symbols and notes are inked in black unless otherwise indicated.

Cartographic Codes Tables

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Table A-1. Control Stations§

Single purpose cartographic codes - Point Features

Cartographic codes	Descriptions	Symbols and examples
139	Basic or supplemental control station*	 101 MORTON, 1959 (Symbol and lettering inked in red with center of symbol inked in black.)
243	Hydrographic station**	 213 TRAV-1, 1975 (Symbol and lettering inked in red with center of symbol inked in black.)
250	Basic or supplemental control station (recoverable) used as an electronic positioning system antenna site*	 102 SANDY, 1973 (Symbol and lettering inked in red with center of symbol inked in black.)
252	Hydrographic station located by sextant fixes or cuts	 319 (chy) (Symbol and number inked in blue with center of symbol & (chy) inked in black.)
253	Hydrographic station located by unconventional methods [¶]	 327 (cup) (Symbol and number inked in green with center of symbol & (cup) inked in black.)
254	Undescribed, nonrecoverable station used as an electronic positioning system antenna site**	 117 AA-74, 1974 (Symbol and lettering inked in red with center of symbol inked in black.)

§ Station names and numbers of tanks, gables, chimneys, piles, rocks, and similar recoverable objects used as signals shall be accompanied by a brief description in black ink in parentheses, unless described in the control station name. Signals in water areas always shall be described fully; temporary signals are accompanied by the note "(temp)."

* Use this symbol only to describe marked, recoverable stations and intersection stations of third-order class-II or higher accuracy. This symbol shall be used only for stations included, or intended for inclusion, in the NGS system of adjusted geodetic stations.

** Stations located by traverse, plane table, or photogrammetric (including aerotriangulation) methods, or, undescribed, nonrecoverable stations of third-order or lower accuracy.

[¶] Station located by spotting its position on a topographic map or aerial photograph for transfer to the hydrographic sheet.

Table A-2. Dangers to Navigation and Soundings

Single purpose cartographic codes - Point Features

Cartographic codes	Descriptions	Symbols and examples
711	Sounding	13 ²
367	Sounding, labeled hard	5 ³ hrd
089	Rock or coral head (depth known or unknown)	+
165	Rock or coral head@ (with est. depth)	+ covers 0 ⁵ m at MLLW
988	Islet	° (1)
098	Wreck	⚓
278	Dolphin	° dol
279	Pile	° pile
280	Pipe	° pipe
281	Stake	° stake
282	Stump	° stump
283	Snag	° snag
284	Obstruction	° obstr
286	Crib (symbol)	⊞ crib
232	Deadhead (usually one end afloat)	° deadhead
893	Ruins (symbol)	⊞ ruins
885	Duck blind (temporary structure)	⊞ duck blind
886	Duck blind ruins (temporary structure)	⊞ duck blind ruins
056	Oil or gas well	° well
111	Platform - oil or gas	⊞ platform
248	Platform (survey)	⊞ survey platform
249	Platform (oil or gas), lighted	⊞ oil platform (lighted)
075	Sand waves (label only)	sand waves

Table A-2. Dangers to Navigation and Soundings (continued)

Single purpose cartographic codes - Point Features

<u>Cartographic codes</u>	<u>Descriptions</u>	<u>Symbols and examples</u>
533	Spoil (label only)	<i>spoil</i>
534	Waterfall (label only)	<i>waterfall</i>
535	Rapids (label only)	<i>rapids</i>
536	Eddies (label only)	<i>eddies</i>
537	Shoal (label only)	<i>shoal</i>
538	Foul (label only)	<i>foul</i>
539	Breakers (label only)	<i>breakers</i>
599	Kelp (label only -- used to indicate extensive kelp beds visible on the surface.)	<i>kelp</i>
103	Kelp (symbol) not to be used for bottom characteristic but to indicate small isolated patches visible on the surface.	
146	Tide rips (label only)	<i>tide rips</i>
090	Wire-drag clearance	<i>42 Wk-cleared by 40 ft</i>
957	Rock - side scan sonar depth	<i>12⁵ Rk (A)</i>
961	Wreck - side scan sonar depth	<i>13⁵ Wk (A)</i>
967	Obstruction - side scan sonar depth	<i>19⁵ Obstr (A)</i>

Table A-3. Buoys

Single purpose cartographic codes - Point Features

Buoy single purpose cartographic code = 124

Cartographic codes	Descriptions*	Symbols and examples
124	Vertically striped buoy, lighted,	
214	Vertically striped buoy (e.g., black and white midchannel can buoy, unnumbered)	 EW C (Lettering in red ink.)
182	Horizontally banded buoy, lighted, (e.g., red over green; lettering in red ink)	 RG
216	Horizontally banded buoy (e.g., red and black junction can buoy, unnumbered, lettering in red ink.)	 RB C
211	Diagonally banded buoy, lighted	
217	Diagonally banded buoy	
259	Open buoy symbol, lighted	
212	Open buoy symbol	
498	Mooring buoy, lighted	
215	Mooring buoy	
472	Checkered buoy, lighted	
218	Checkered buoy	
257	Red buoy, lighted (e.g., bell buoy, number 4) [Buoy diamond symbol & lettering in red ink.]	 BELL "4"
255	Red buoy (e.g., red nun buoy, number 32) [Buoy diamond symbol & lettering in red ink.]	 N "32"

*Description: color, function and/or special marking to be labeled as appropriate. The color sequence is from top to bottom where multiple colors are in horizontal bands. Where multiple colors are in vertical or diagonal stripes, the darker color is given first.

Table A-3. Buoys (continued)

Single purpose cartographic codes - Point Features

Cartographic codes	Descriptions*	Symbols and examples
258	Black buoy, lighted (e.g., bell buoy, number 5) [Buoy diamond symbol in black ink, lettering in red ink.]	 BELL "5"
256	Black buoy (e.g., black can buoy, number 33) [Buoy diamond symbol in black ink, lettering in red ink.]	 C "33"
482	Green buoy, lighted [Buoy diamond symbol filled in green ink.]	
481	Green buoy [Buoy diamond symbol filled in green ink.]	
787	Super buoy, lighted (tanker terminal)	
947	Articulated light	
950	Articulated daybeacon (inside of triangle and the note "Art" are inked in red)	 Art
951	Articulated daybeacon (inside of square filled with green ink and the note "Art" is inked in red)	 Art

*Description: color, function and/or special marking to be labeled as appropriate. The color sequence is from top to bottom where multiple colors are in horizontal bands. Where multiple colors are in vertical or diagonal stripes, the darker color is given first.

Table A-4. Bottom Characteristics

Single purpose cartographic code -- Point Features

Bottom characteristics single purpose cartographic code = 550

Terms	Examples	Adjectives	Examples	Colors	Examples
Coarse	<i>Co</i>	Gritty	<i>gty</i>	Black	<i>bk</i>
Clay	<i>Cl</i>	Rocky	<i>rky</i>	White	<i>wh</i>
Silt	<i>Silt</i>	Fine	<i>fne</i>	Gray	<i>gy</i>
Mud	<i>M</i>	Medium	<i>med</i>	Brown	<i>br</i>
Sand	<i>S</i>	Coarse	<i>crs</i>	Red	<i>rd</i>
Gravel	<i>G</i>	Soft	<i>sft</i>	Yellow	<i>yl</i>
Shingle	<i>Sn</i>	Hard	<i>hrd</i>	Blue	<i>bu</i>
Coral head	<i>Co Hd</i>	Sticky	<i>stk</i>	Orange	<i>or</i>
Pebbles	<i>P</i>	Broken	<i>brk</i>	Green	<i>gn</i>
Spots	<i>St</i>	Speckled	<i>spk</i>	Violet	<i>vi*</i>
Boulders	<i>Blds</i>	Light	<i>lt</i>		
Shells	<i>Sh</i>	Dark	<i>dk</i>		
Coral	<i>Co</i>	Small	<i>sml</i>		
Oysters	<i>Oys</i>	Large	<i>lrg</i>		
Sponge	<i>Spg</i>				
Seaweed	<i>Wd</i>				
Grass	<i>Grs</i>				

* The dot over the italicized "i" is to be eliminated when lettered on the smooth sheet.

Table A-4. Bottom Characteristics (continued)

Sediments Classified by Size		
Type	Term	Grain Diameter (mm)
Clay		
	Mud	0.02-0.1
Silt		
	Fine	0.1-0.3
Sand	Medium	0.3-0.5
	Coarse	0.5-1.0
	Fine	1-2
Gravel	Medium	2-4
	Coarse	4-6
	Fine	6-10
Pebbles	Medium	10-20
	Coarse	20-35
Stones		50-250
Boulders		≥250

Careful inspection by sight and touch should enable the hydrographer to provide a reasonably accurate description of the material.

Close to shore and on the Continental Shelf, bottoms generally consist of sands, gravels, muds, and the remains of plant and animal life. Ledge rock may be exposed in a few areas close to shore where slopes are steep. Sediments are typed according to the size of their particles. It is not intended that the dimensions be measures. A careful estimation by eye is satisfactory.

Sediments larger than sand are easy to recognize and simple to classify by size. Generally, sand is recognizable as even the finer grained sands feel gritty when rubbed between a finger and the palm of the hand.

When dry, sand separates into grains visible to the naked eye.

Technically, there are two classes of material finer than sand. These are silt and clay. For practical purposes, silt and clay are classified under the general term, mud.

If the material feels gritty when rubbed between the fingers, it may be properly classified as silt. Clay is a finer grained deposit than silt and normally feels smooth and sticky to the touch.

Ooze is not soft mud, as commonly interpreted, but is a pelagic sediment containing more than 30% organic material and is found only in the greater ocean depths off the Continental Shelf on the abyssal plains.

Table A-5. Nonfloating Aids to Navigation and Landmarks

Single purpose cartographic code -- Point Features

Cartographic codes	Descriptions	Symbols and examples
086	Accurate fixed point (landmark*, marker, sign) of less than third-order accuracy	⊙ TANK, ELEVATED (Country Club Hills) (landmark: 60 ft above ground, 245 ft above MHW)
139	Structure, of third-order or better accuracy, used as a signal (Give station name and year, and U.S. Coast Guard Light List name if different)‡ (Triangle & lettering in red ink; triangle center in black ink.)	△ 108 SAND POINT LIGHTHOUSE, 1887 (Bay Shaft Light)
139	Structure, of third-order accuracy, not used during the survey, but suitable for use as a landmark§ (Triangle & station name in red ink; triangle center in black ink.)	△ RADIO TOWER, WNOR, 1972 (landmark: 620 ft above ground 705 ft above MHW)
200	Lighted structure, not used as a signal and located by less than third-order methods (Give U.S. Coast Guard Light List name.)	⊙ Bald Pt Lt
208	Light, front range** (Use U.S. Coast Guard Light List name.)	⊙ Range Front Light
209	Light, rear range** (Use U.S. Coast Guard Light List name.)	⊙ Range Rear Light

* Landmarks of third-order or better accuracy that were not used to control the survey are shown using the triangulation station symbol and the landmark description; e.g., cartographic code 139. Cartographic code numbers 086 and 200 are also used for photogrammetrically determined positions.

** If such range lights are located in accordance with third-order accuracy requirements, they shall be indicated as cartographic code 139 in the hydrographic digital file and symbolized on the smooth sheet with the triangulation station symbol.

‡ If used as a signal, but no longer in service, indicate as follows: (abandoned).

§ If an aid to navigation or landmark was located by less than third-order methods for use as a signal, the appropriate control station symbol takes precedence; e.g., cartographic code 243.



Table A-5. Nonlighting Aids to Navigation and Landmarks
(continued)

Cartographic codes	Descriptions	Symbols and examples
243	Aid to navigation, located photogrammetrically and used as a hydrographic signal; e.g., black daybeacon number 33.	⊙ 187 (B Bn "33") (Symbol circle & lettering in red ink; symbol center in black ink.)
223	Daybeacon (open) (color, function and/or special marking to be labeled as appropriate.)	△
219	Daybeacon (black)	▲ "33" (Lettering in red ink)
224	Daybeacon (red)	▲ "32" (Red ink)
767	Daybeacon (green)	▲ "5" (Lettering in red ink.)
229	Marker (privately maintained, lighted)	◦ priv marker (lighted)
261	Marker (privately maintained)	◦ priv marker
221	Marker, measured course--front (indicate nautical miles unless otherwise specified.)	◦ marker (mile)
222	Marker, measured course--rear (indicate nautical miles unless otherwise specified.)	◦ marker (mile)
246	Marker, front dredging range	◦ marker (dredging range)
247	Marker, rear dredging range	◦ marker (dredging range)
906	Daybeacon, front range (color to be labeled as appropriate.)	△ F Range Bn (Lettering in red ink.)
907	Daybeacon, rear range (color to be labeled as appropriate.)	△ R Range Bn (Lettering in red ink.)

Table A-6. Miscellaneous Features

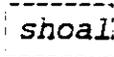
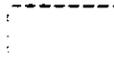
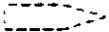
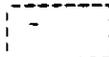
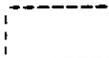
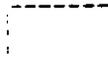
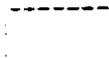
Single purpose cartographic codes - Point Features

Cartographic codes	Descriptions	Symbols and examples
078	Data for which a symbol is not to be plotted. (This code also may be utilized for detached positions used to delineate features.)	(No symbol)
244	Tide or water level gaging station.	 Tide Station (Symbol and lettering in blue ink.)
245	Current station.	 Current Station (Symbol and lettering in blue ink.)
480	Anchorage (large vessels)	
702	Anchorage (small vessels)	
993*	Potential landmark (photogrammetrically identified)	 Tower

* Cartographic code 993 is for field and AHS/PHS (data acquisition and processing) use only. Such features should be investigated during hydrographic survey field work and either rejected or upgraded to cartographic code 086 or 139.

Table B-1. Dangers to Navigation

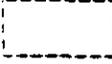
Single purpose cartographic codes - Line Features

Cartographic codes	Descriptions	Symbols and examples
002	Shoal/shallow (area limits)	 shoal
004	Stationary structure, floating or fixed (to scale); e.g., floating breakwater, float, ski jump, etc.	 float  crab pen (fixed structure)
009	Reef or ledge (area limits)	
011	Breakers (area limits)	 breakers
044#	Wreck, hulk, visible (to scale)	 hulk
045	Wreck, hulk (to scale)	
060	Danger area limits, obstructions (described)	
112	Sand waves (area limits)	 sand waves
118	Submarine cable	 subm cable
121	Fish trap (actual configuration)	 fish trap
285	Ruins* (configuration or area limits)	 ruins
314	Depth curve - approximate	
477	Wreckage (area limits)	 wreckage
489	Platform, oil* or gas (drawn to scale-actual configuration)	 oil platform
604	Depth curve	
791	Pipeline*	 subm pipeline
802	Ramp--hydrographic feature (to scale)	 ramp

* Use code 044 to designate a wreck, hulk, any part of which (hull or superstructure) protrudes above the sounding datum; i.e. MLLW. Use slanted lettering if the hulk is not visible at mean high water.

Table B-1. Dangers to Navigation
(continued)

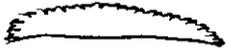
Single purpose cartographic codes - Line Features

Cartographic codes	Descriptions	Symbols and examples
869	Living resources, oyster bed/bar (area limits)	 <i>oys</i>
871	Kelp (area limits)	 <i>kelp</i>
872	Grass (area limits)	 <i>Grs</i>
892	Crib* (configuration or area limits)	 <i>crib</i>
894	Foul (area limits)	 <i>foul</i>
921	Floating barrier - log boom, hyacinth boom, oil* barrier, etc.	 <i>log boom</i>
925	Piles,* poles, stakes, etc. (row or configuration)	 <i>piles</i>

* The dot over the italicized "i" is to be eliminated when lettered on the smooth sheet.

Table B-2. Low Water Line and Associated Features

Single purpose cartographic codes - Line Features

Cartographic codes	Descriptions	Symbols and examples
008	Zero depth curve from photogrammetric shoreline maps or topographic surveys	
013	Zero depth curve drawn from corrected soundings	 [orange ink]
188	Zero depth curve estimated and sketched from hydrographic data	 [orange ink]
530	Ledge*	
530	Reef	
531	Ledge/reef (symbol at 1/2 scale)	

* See also figure B-4 for more detailed ways to depict ledges and reefs.

Table 3. Shoreline and Alongshore Features

Single purpose cartographic codes - Line Features

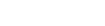
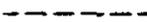
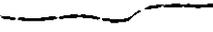
The cartographic codes listed below may be included in the digital hydrographic file only if the features were identified and/or located by the hydrographer and if identical features are not shown on the shoreline map. When these features are included in the hydrographic file, they shall be smooth plotted in red ink. When they originate with the shoreline map (TP-sheet), they shall be smooth plotted in black ink; e.g., codes 001, 003, and 007. The above rules do not apply to submerged features represented by cartographic codes 026, 029, 042, 228, and 801. These five features should always be included in the hydrographic survey file whether located by the hydrographer or the photogrammetrist, and they shall always be plotted in black ink.

Cartographic codes	Descriptions	Symbols and examples
001	Approximate shoreline (HWL)	-----
003	Marsh, swamp, and mangrove (apparent shoreline as shown on the shoreline map)	_____
007	Fast solid land	_____
016	Floating pier* or pier section (single or double line)	_____ - floating pier
026	Breakwater, jetty (submerged or awash)	----- <i>subm bkw</i>
027	Breakwater, jetty (single or double line)	_____ breakwater
029	Breakwater, jetty (submerged area limits)	===== <i>subm bkw</i>
030	Pier* (single or double line)	_____ pier
031	Groin* (single or double line)	_____ groin
038	Wharf, bulkhead, seawall, riprap etc. (to be accompanied by an appropriate annotation)	_____ bkhd
039	Marine railway*	_____ marine railway
040	Drydock	_____ drydock
041	Floating drydock*	_____ floating drydock
042	Marine railway* (subm offshore limits)	----- <i>marine railway</i>

* Eliminate the dot over the "i" when lettered on the smooth sheet.

Table B-3. Shoreline and Alongshore Features (continued)

Single purpose cartographic codes - Line Features

Cartographic codes	Descriptions	Symbols and examples
043	Lock	 lock
055	Ramp	 ramp
057	Bridge (general, actual configuration)	 bridge
059	Bridge (symbol, single line)	
144	Fast solid land (accurate shoreline revision sketched by the hydrographer)	 [red ink]
145	Fast solid land (estimated shoreline revision sketched by the hydrographer)	 [red ink]
189	Marsh, swamp, and mangrove (estimated revision of apparent shoreline sketched by the hydrographer)	 [red ink]
190	Marsh, swamp, and mangrove (accurate revision of apparent shoreline sketched by the hydrographer)	 [red ink]
228	Groin (submerged portion)	 subm groin
425	Bridge fender	 bridge fender
483	Fence (linear feature)	
801	Pipeline--sewer outfall, cooling water intake, etc. (submerged)	 subm sewer outfall
808	Overhead cable (power/telephone) #	 ovhd power cable
862	Overhead pipeline #	 ovhd pipeline
877	Glacier (terminus limits)	 glacier

Cartographic codes 808 and 862 are symbolized on the smooth sheet by a short dashed black line extending shoreward of the MHW. Orient the dashed line so that its extension will indicate the direction of the feature over the water area. Use code 086 (table A-5) to indicate the positions of individual support poles in the water area (positioned either photogrammetrically or by detached positions). Code 862 may be used to identify a sewer outfall; the dashed line will extend to the end of the feature in the foreshore area, and a descriptive note in vertical lettering "sewer outfall" will be added to the smooth sheet.

Table C. Units

Single purpose cartographic codes - Units

Units Positive (+) or Negative (-)	Cartographic Code
whole feet	126
feet and tenths	127
feet and fractions	128
whole fathoms	129
fathoms and tenths	130
fathoms and fractions	131
whole meters	710
meters and tenths	711

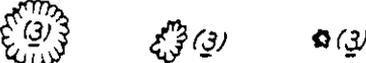
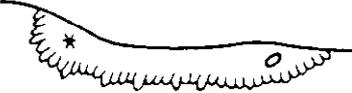
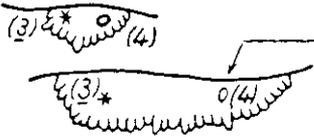
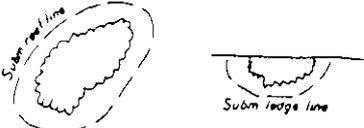
SYMBOLIZATION FOR ROCKS

Although this example is based on a 2-ft. range of tide, the zone values are valid for any range.

ZONE VALUES			
	< 5.3		
	↕	0 (3)	0 (5)
	4.3		
4.0 ft —	< 4.3	* (4)	* (4)
	↕		
	3.3		
3.0 ft —	< 3.3	* (3)	* (3)
	↕		
	2.3		
2.0 ft —	< 2.3	MHW	
	↕	* (2)	* (2)
	1.3		
1.0 ft —	< 1.3	* (1)	* (1)
	↕		
	0.3		
0.0 ft —	< 0.3	MLLW	LWD
	↕	* awash MLLW or * (0)	* (0)
	-0.7		
-1.0 ft —	> -0.7	* COV 1 ft at MLLW	* COV 1 ft at LWD
	↕		
	-1.7		
-2.0 ft —	> -1.7	* COV 2 ft at MLLW	* COV 2 ft at LWD
	↕		
	-2.7		
-3.0 ft —	> -2.7	+ COV 3 ft at MLLW (for estimated depth) 3RK (when sounding was taken on rock) (ft) + (for unknown depth)	+ COV 3 ft at LWD (for estimated depth) 3RK (when sounding was taken on rock) (ft) + (for unknown depth)
	↕	0 ⁵ RK (when sounding was taken on rock) (fm)	0 ⁵ RK (when sounding was taken on rock) (fm)
	-3.7		
		ATLANTIC & PACIFIC COASTS, GULF OF MEXICO, ALASKA, and HAWAII	GREAT LAKES

--- Rock and islet symbols and elevation references

CARTOGRAPHIC SYMBOLS

	<p>Reef uncovers at sounding datum. (Elevation unknown)</p>
	<p>Reef uncovers 3 ft at sounding datum.</p>
	<p>Rocks (high points) atop reef. (Elevations unknown)</p>
	<p>Elevations of bare rocks from topographic source are shown in red on hydrographic survey</p> <p style="text-align: right;">Elevations of rocks are known.</p>
	<p>Ledge uncovers at sounding datum.</p>
	<p>Ledge indicates foreshore characteristic only; dotted line is low water line.</p>
	<p>Rocks (high points) atop ledge. (Elevations unknown)</p>
	<p>Bare rocks from hydrographic source are shown in red on hydrographic survey</p> <p style="text-align: right;">Elevations of rocks are known.</p>
<p>Co</p>	<p>Add this abbreviation if the features are coral.</p>
<p>*</p>	<p>Reef is smaller than 1.5 x 1.5 mm.</p>
	<p>Dashed line indicates that portion of reef or ledge covered at sounding datum.</p> <p style="text-align: center;">Note: These two illustrations are generally found only on photogrammetric shoreline maps. Except on exposed coasts, developments on hydrographic surveys should be sufficient to provide soundings and depth curves which will supersede the submerged ledge areas delineated on the shoreline maps.</p>

Symbols and elevation references for reefs and ledges

